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CONTAINER WITH SELECTIVELY VENTED LID

FIELD OF THE INVENTION

[0001] Our invention generally relates to the field of containers having a bowl and a lid attachable thereto. In particular our invention relates to such containers that are selectively ventable to allow ventilation of the container.

BACKGROUND OF THE INVENTION

[0002] Containers, generally having a bowl and a lid, for storing food items and the like are well known. In recent years, consumer demand for more sophisticated containers has resulted in increased competition in the container industry. For example, today's consumers want, among other things, containers that are easy to use, that are adaptable to multiple uses, and are capable of withstanding extreme temperatures generally associated with freezing and/or microwaving of the contents of the container.

[0003] Different foods require different storage conditions for optimum preservation. For example, certain foods, such as fruits and vegetables, tend to respire and, in the process emit a certain amount of water vapor. In conventional, un-vented containers, this water vapor is trapped in the container and contributes to the premature spoilage of the stored fruits and/or vegetables. In order to prevent this premature spoilage, it is desirable that fruits and vegetables be stored in ventilated containers that are tailored to allow the fruits and vegetables to respire. Other products, such as desserts, have a tendency to absorb odors from other foods in the refrigerator or freezer. It is desirable that these products be stored in a container that is tightly sealed, so that they are not exposed to undesirable odors.

[0004] Sealed containers are well known in the art; however, they do not provide suitable means for storing fruits and vegetables that need to be ventilated. Conversely, various vented containers also exist; however, these containers do not provide suitable means of sealing the container for storing, for example, odor absorbent foods.

[0005] Some strategies that have been used for providing a ventilated container include covering a bowl with plastic wrap having holes punched in the top, loosely setting a lid on a container, placing a plate over a bowl, etc. Each of these techniques, however, suffers from a number of disadvantages. For example, in each of these arrangements, since the cover is not firmly attached, it may be accidentally knocked off, thereby providing no cover at all. Conversely, the lid may be accidentally pushed into place so that the bowl becomes tightly sealed and no respiration is possible. Moreover, these arrangements are not conducive to stacking of multiple containers, nor are they easily adaptable to store different types of products.

[0006] Another problem faced by conventional containers is microwaving a product contained therein. With conventional food storage containers, if the lid is left sealed to the bowl of the container when heating food stored within, there is no venting of the inside of the container to the ambient air. Consequently, as the container's contents are warmed in a microwave oven, air within the container expands and the container may deform, or the lid may burst off, splattering the contents of the container. This may also cause damage to the container.

[0007] Of course, to avoid such deformation, the lid could be removed from the bowl during microwaving. As the open bowl is warmed, however, it is not uncommon for liquid contents to splatter. Thus, without a lid, this splattering could again lead to a soiled microwave oven.

[0008] Conventional attempts to avoid these problems typically involve removing the lid and setting it loosely on the bowl, prior to heating the contents of the container. However, if the lid is not offset relative to the bowl during heating, a vacuum can be created between the lid and the bowl, and the aforementioned problem of container deformation is not averted. Additionally, offsetting the lid on the bowl lessens, but may not eliminate the splattering problem. Also, when the lid rests loosely on the bowl, two items (we.e., the bowl and the lid) need to be removed from the microwave oven, both having the potential of being hot and, therefore, difficult to handle.

[0009] Various attempts have been made in the art to provide a vented container. For example, U.S. Patent Nos. 2,241,064; 4,600,117; 5,065,889; and 5,388,714, are each directed to a selectively ventable container. None of these patents, however, discloses that the container can be suitably sealed. Instead these containers each utilize a lid that covers, but does not seal, a container.

[0010] U.S. Patent No. 3,797,694 is directed to a container that may be sealed, or selectively vented during use, depending on whether the lid is placed on the container in a raised or lowered position. However, a container according to this patent may be difficult to use and may not provide a secure attachment of the lid to the bowl. In particular, it may be difficult to place the lid on the bowl in the vented condition, since pressure applied to the lid will seal the container. Consequently, this arrangement has a further disadvantage in that it does not readily allow for stacking of multiple containers. If an object, such as another container, were placed on top of the vented container, the lid could be pressed downward, thereby sealing the bottom container.

[0011] Accordingly, there remains a need in the art for an adaptable container that can be selectively sealed or vented, or improvements thereon depending on the product that is to be stored therein. In addition, there is a need for a container that can effectively be used in a microwave to heat a product held therein.

SUMMARY OF THE INVENTION

[0012] Our invention remedies these and other deficiencies in the prior art and provides an inexpensive container that is selectively ventable and can be safely and easily used to heat products in the microwave.

[0013] According to one aspect, our invention relates to a container comprising a bowl having a rim about its upper periphery and a lid having a lip. The lip has a continuous sealing bead about its periphery, and at least one vent region. The lid is configured for attachment to the bowl in a plurality of different orientations, including (we) a first orientation in which the lid is attached to the bowl with the sealing bead in continuous contact with the rim along the entire perimeter of the rim, thereby sealing the container, and (ii) a second orientation in

which the lid is attached to the bowl with the at least one vent region providing ventilation of the container.

[0014] As used herein, the term "bowl" should be interpreted broadly to include any receptacle for holding goods, regardless of size, shape, material, construction or the like.

[0015] According to another aspect, our invention relates to a container comprising a bowl having a rim about its upper periphery and a lid configured for attachment to the bowl in a plurality of different orientations. The various orientations include (we) a first orientation in which the lid is attached to the bowl and forms a continuous seal with the rim along the entire perimeter of the rim, thereby sealing the container, and (ii) a second orientation in which the lid is attached to the bowl so as to allow ventilation of the container. The second orientation of the lid is offset about the vertical axis relative to the first orientation of the lid.

[0016] According to yet another aspect, our invention relates to a container comprising a bowl and a lid attachable thereto. One of the bowl and the lid has a rim extending around the perimeter thereof, and the other of the bowl and the lid has a lip with a continuous sealing bead for engagement with the rim. The sealing bead includes at least one stepped portion having a height offset from a remainder of the sealing bead. The lid is configured for attachment to the bowl in a plurality of different orientations, including (we) a first orientation in which the sealing bead is in continuous contact with the rim along the entire perimeter of the rim, thereby sealing the container, and (ii) a second orientation in which the stepped portion does not contact the rim, thereby providing ventilation of said container.

[0017] According to still another aspect, our invention relates to a container comprising a bowl and a lid attachable thereto. One of the bowl and the lid has a rim extending around the perimeter thereof, and the other of the bowl and the lid has a lip with a continuous sealing bead for engagement with the rim. The rim includes at least one stepped portion having a height offset from a remainder of the rim. The lid is configured for attachment to the bowl in a plurality of different orientations, including (we) a first orientation in which the sealing bead is in continuous contact with the rim along the entire perimeter of the rim, thereby

sealing the container, and (ii) a second orientation in which the stepped portion does not contact the sealing bead, thereby providing ventilation of the container.

[0018] A better understanding of these and other aspects, features, and advantages of the invention may be had by reference to the drawings and to the accompanying description, in which preferred embodiments of the invention are illustrated and described.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIG. 1 is an elevated perspective view of a bowl of a first embodiment of our invention.

[0020] FIG. 2 is a top plan view of the bowl of the first embodiment of our invention.

[0021] FIG. 3 is a front, partial section view of the bowl of the first embodiment of our invention, the section being taken along line 3--3 in FIG. 2.

[0022] FIG. 4 is a cross-sectional side view of the bowl of the first embodiment of our invention taken along line 4--4 in FIG. 2.

[0023] FIG. 5 is a perspective view of a lid of the first embodiment of our invention.

[0024] FIG. 6 is a top plan view of the lid of the first embodiment of our invention.

[0025] FIG. 7A is a front view of the lid of the first embodiment of our invention.

[0026] FIG. 7B is a cross-sectional view of the lid of the first embodiment of our invention taken along line 7B--7B in FIG. 6.

[0027] FIG. 7C is a cross-sectional view of the lid of the first embodiment of our invention taken along line 7C--7C in FIG. 6.

[0028] FIG. 8A is a side view of the lid of FIG. 6.

[0029] FIG. 8B is a cross-sectional view of the lid of the first embodiment of our invention taken along line 8B--8B in FIG. 6.

[0030] FIG. 8C is a cross-sectional view of the lid of the first embodiment of our invention taken along line 8C--8C in FIG. 6.

[0031] FIG. 9A is an enlarged, cross-sectional view of the lip taken at 9A in FIG. 8B.

[0032] FIG. 9B is an enlarged, cross-sectional view of the lip taken at 9B in FIG. 8C.

[0033] FIG. 10A is a front, partial cut-away view of the container of the first embodiment of our invention showing the lid attached to the bowl in an orientation such that the container is sealed.

[0034] FIG. 10B is a front, partial cut-away view of the container of the first embodiment of our invention showing the lid attached to the bowl in an orientation that allows ventilation of the container.

[0035] FIG. 11 is an elevated perspective view of a bowl according to a second embodiment of our invention.

[0036] FIG. 12 is a plan view of a lid of the second embodiment of our invention.

[0037] FIG. 13 is a cross-sectional front view of the lid of the second embodiment of our invention, taken along line 13--13 in FIG. 12.

[0038] FIG. 14 is an exploded perspective view of a container according to a third embodiment of our invention.

[0039] Throughout the figures, like or corresponding reference numerals denote like or corresponding parts.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0040] Generally, a container according to our invention comprises a bowl and a lid attachable thereto in a plurality of different orientations. In at least one orientation, the lid is attached to the bowl in a sealed condition, while in at least one other orientation the lid is attached to the bowl in a vented condition. The seal formed between the lid and the bowl in the first orientation should substantially prevent transfer of air between the interior of the container and the environment. The seal may be a hermitic seal, but need not be such. For applications that require a hermetic seal, it may be desirable to provide a more robust sealing surface, e.g., by providing a larger sealing bead, multiple sealing beads, other seal enhancing features, or combinations thereof.

[0041] The container may be made of any of polypropylene, polyethylene, and polycarbonate, but is preferably made of polypropylene. Preferably the container is manufactured by injection molding; however, any other suitable manufacturing technique may also be used, such as thermoforming or blowmolding.

[0042] As shown in FIGS. 1-10, a container 100 according to one preferred embodiment of our invention generally comprises a bowl 102 and a lid 104 attachable thereto. The lid 104 is configured for attachment to the bowl in a plurality of different orientations, including (we) a first orientation (see FIG. 10A) in which the lid is attached to the bowl so as to seal the container, and (ii) a second orientation (see FIG. 10B) in which the lid is attached to the bowl so as to allow ventilation of the container.

[0043] As illustrated in FIGS. 1-5, and particularly FIG. 3, the bowl 102 is delimited at its bottom by a base 124 and at its sides by a peripheral wall 126 that projects generally upward from around the periphery of the base 124. The peripheral wall 126 is preferably scalloped, so as to lend structural support to the bowl 102. As shown in FIG. 1, the scallops 134 are essentially convex, vertical panels arranged about the perimeter of the bowl 102.

[0044] Preferably, plural elongated, raised ridges 130 are arranged in parallel in the bottom of the bowl 102. As best seen in FIGS. 2 and 4, each of the ridges 130 is spaced apart from the peripheral wall 126 of the bowl 102 and/or from the next adjacent ridge 130. This spaced apart arrangement results in the bottom of the bowl 102 generally consisting of a series of interconnected troughs 142. The ridges 130 support the product stored in the bowl 102 in an elevated position relative to the base 124 of the container. Thus, if any water drains from the stored product -- as might be the case with, for example, frozen meats, rinsed fruits and vegetables, or the like -- the water will flow into the troughs 142 and will be kept away from the stored product. The ridges 130 also keep the product raised out of contact with any moisture that may collect as a result of transpiration from the product. Additionally, the ridges 130 allow the bowl 102 to be used as a steamer, as discussed in greater detail below. A ridge 130 running through the center of the bowl 102 is discontinuous and has a center foot 132 which is at substantially the same level as the troughs 142. The center foot 132 provides additional rigidity to the bowl 102 and also provides a center support for the bowl 102. During manufacturing, the center foot 132 is the location where the plastic enters the mold. The flat surface of the foot 132 allows the plastic to enter and be evenly distributed in the mold. It will be understood that any number, shape, spacing, and orientation of raised features could also be used, so long as the bottom surface of the bowl 102 is able to support a product at a level higher than the base 124. For example, any number of raised bumps, frustums, linear ridges, curved ridges, or the like, may effectively be use. Alternatively, a separate platform or stage element could be placed in the bottom of the bowl 102 in order to support a product in a raised position.

[0045] A rim 106 is disposed around the perimeter of the upper, distal end 128 of the peripheral wall 126. As best seen in FIGS. 3 and 4, the rim 106 comprises an upward flange 116 projecting vertically from the rim 106 for engaging with the lid 104 and an outward flange 118 extending horizontally outward from the rim 106. The rim 106 also includes a number of "denesting lugs" 114 positioned about the perimeter of the rim 106. These denesting lugs 114, as their name suggests, prevent the bowl 102 from becoming jammed together when several bowls 102 are nested. Alternatively, or in addition, the rim 106 may include an enlarged ring (not shown), which extends around the perimeter of the bowl 102, and provides additional structural support to the bowl 102.

[0046] The rim 106 provides structural support to the bowl 102 and acts as a firm base from which the upward and outward flanges 116, 118 extend. The upward flange 116 provides a surface against which the lid 104 can seal when the lid 104 is sealingly engaging the bowl 102. The upward flange 116 has a pair of notched or recessed portions 122 formed along the periphery of the upward flange 116 on opposite sides of the bowl 102. When viewed from the side, recessed portions 122 of the upward flange 116 have a lower overall height than the remainder of the upward flange 116 (we.e., the upward flange 116 has "stepped portions"). These recessed portions 122 work in combination with vent regions 112 in the lid 104 to selectively provide ventilation to the interior of the container 100 when the lid 104 is placed in a predetermined orientation relative to the bowl 102. The outward flange 118 provides a grasping surface and facilitates easy handling of the bowl 102. The outward flange 118 is extended somewhat at the two longitudinal ends of the bowl 102 so as to form handles 136 for grasping and transporting the bowl 102.

[0047] The outward flange 118 of the bowl 102 is preferably labeled "VENT" and "SEALED," as shown in FIGS. 1 and 2, and the lid 104 is preferably marked with indicator 148, to indicate which orientation of the lid 104 will result in a sealed condition and which orientation will result in a vented condition. That is, when the indicator 148 is aligned with the VENT label the container will be vented, whereas when the indicator 148 is aligned with the SEALED label the container will be sealed. Alternatively, the label could be placed in a different location on the bowl 102, such as on the peripheral wall 126, or on the upward flange 116. Moreover, the labels and the indicator 148 could be reversed, such that the indicator 148 is positioned on the bowl 102 and the labels are positioned on the lid 104. Furthermore, while the labels are shown as being the words SEALED and VENT, other suitable words, numbers, symbols, colors, and/or pictures could also effectively be used. For example, a picture of a fan could be used to indicate a vented condition, while a zipper could be used to indicate a sealed condition.

[0048] The lid 104 is depicted in FIGS. 5 and 6 as being a substantially rectangular panel having a lip 108 disposed around its perimeter. It will of course be understood that the lid 104 may be any of a variety of shapes, and will typically mimic the shape of the bowl 102. A tab 140 is formed at one corner of the lid 104 for grasping by a user to manipulate and

remove the lid 104 from the bowl 102. The location of the tab 140 is not critical; however, it has been found that locating the tab at a corner of the lid 104 allows the container 100 to be easily opened and closed.

[0049] A pair of vent regions 112 is disposed along the lip 108 at one end of the lid 104. Each of the vent regions 112 preferably comprises a plurality of substantially hemispherical domes or bubbles 144. Alternatively, the vent regions 112 could be comprised of one or more elongated, flared, expanded, enlarged, or overhanging portions. Still further, the vent regions 112 could each take the form of one or more through holes (as illustrated at 312 in FIG. 14), oblong ports, recesses, or notchs removed from the outer portion of the lip 108, or any other feature that would enable the lip 108 to provide venting of the interior of the container 100. Furthermore, while a pair of vent regions 112 is shown, any number of vent regions could be provided as desired for a given application.

[0050] FIG. 7A is a front view of the lid 104, showing the peripheral lip 108 around the edge of the lid 104. FIG. 7B is a cross-sectional view of the lid 104 taken along line 7B--7B in FIG. 6. The lip 108 has an inverted V-shaped cross section, with the apex 120 of the V-shape at the top of the lip 108. A continuous sealing bead 110 is formed on the inner face of the lip 108 to seal against the upward flange 116 of the bowl 102. In FIG. 7B, the sealing bead 110 is shown adjacent to the opening of the V-shaped lip 108. Referring to FIG. 7C, which is a cross-sectional view of the lid 104 taken along line 7C--7C in FIG. 6, the sealing bead 110 is positioned adjacent to the opening of the inverted V-shaped lip 108 over a majority of the perimeter of the lid 104 (right side in FIG. 7C), but transitions to a position adjacent the apex 120 of the inverted V-shaped lip 108 along the length of the vent region 112 (left side in FIG. 7C). Thus, as viewed in profile, the sealing bead 110 includes a stepped portion having a different height relative to the remainder of the sealing bead. Thus, the sealing bead 110 is positioned at two or more different heights around the perimeter of the lid 104.

[0051] FIGS. 8A-8C respectively show a right side view of the lid 104, and cross-sectional views taken along lines 8B--8B and 8C--8C in FIG. 6. FIGS. 9A and 9B are enlarged, detail views of the lip 108 of the lid 104. As shown in FIG. 9A, the sealing bead 110 is positioned above the hemispherical dome 144, adjacent the apex 120 of the V-shaped

lip 108. FIG. 9B shows the sealing bead 110 positioned adjacent the opening of the inverted V-shaped lip 108 on a portion of the lid 104 that is not in the vent region 112. Thus, when the vent regions 112 of the lid are aligned with the recessed portion 122 of the rim (we.e., the stepped portions of the rim 106 and the sealing bead 110 are aligned), the sealing bead 110 will be positioned near the apex 120 of the V-shaped lip 108 (as shown in FIG. 9A) and will not contact the recessed portion 122 of the rim 106. However, when the vent regions 112 are not aligned with the recessed portions 122 of the rim 106, the sealing bead 110 will be positioned near the opening of the V-shaped lip 108 (as shown in FIG. 9B) and will therefore contact and seal against the bottom part of the upward flange 116, even along the recessed portion 122 (as best seen in FIG. 10A).

[0052] The lid 104 of this embodiment is attachable to the bowl 102 in two different orientations. In a first orientation, illustrated in FIG. 10A, the lid 104 is attached to the bowl 102 such that the container 100 is sealed. In this orientation, the vent region 112 of the lid 104 is positioned opposite the recessed portion 122 of the rim 106 of the bowl 102. Thus, the sealing bead 110 is in contact with the upward flange 116 around the entire perimeter of the rim 106. Specifically, because the sealing bead 110 is located adjacent the opening of the inverted V-shape over the portion of the lip 108 that aligns with the recessed portion 122 of the upward flange 116, a seal is still formed between the sealing bead 110 and the recessed portion 122 of the upward flange 116. The portion of the sealing bead 110 that is positioned adjacent the apex 120 of the inverted V-shape is aligned with the full (we.e., not recessed) portion of the upward flange 116 and, thus, also forms a seal between the sealing bead 110 and the upward flange 116.

[0053] In the second orientation, shown in FIG. 10B, the lid 104 is rotated by approximately 180 degrees about an axis substantially normal to the plane of the lid (we.e., "the vertical axis"), relative to the first orientation. In this second orientation, the vent region 112 of the lid 104 is aligned with the recessed portion 122 of the rim 106 of the bowl 102, such that the sealing bead 110 is not in contact with the upward flange 116 along the length of the vent region 112, thereby allowing ventilation of the interior of the container 100. Specifically, because the portion of the lid 104 having the sealing bead 110 positioned near the apex 120 of the inverted V-shaped lip 108 corresponds to the portion of the rim 106 having the recessed portion 122, no seal is formed over this region and the container 100 is

vented. That is, the inside of the container 100 is in flow communication with the ambient environment over the top of the recessed portion 122 and under the hemispherical domes 144, as shown by the broken arrows.

[0054] As best seen in FIG. 10B, the recessed portions 122 of the rim 106 of the bowl 102 are shorter in length than the vent regions 112 of the lid 104, such that only the center four hemispherical domes 144 actually serve to vent the container 100. This difference is primarily for aesthetic purposes, consumers preferring the greater number of hemispherical domes 144 on the lid 104. Of course, the recessed portions 122 of the rim 106 may be the same length, shorter, or longer than the vent regions 112 of the lid 104. Accordingly, all or only a portion of the hemispherical domes 144 provided may actually be used to vent to container 100.

[0055] While the rim 106, having the upward flange 116 and the recessed portion 122, is shown as being a part of the bowl 102, and the V-shaped lip 108, with the continuous, stepped sealing bead 110, is shown as being a part of the lid 104, these features could be rearranged and/or reversed. For example, the bowl 102 could be configured to have a lip with a sealing bead while the lid 104 could be configured to have the corresponding stepped rim formed thereon. Furthermore, each of the bowl 102 and the lid 104 may have any number of such features formed thereon.

[0056] In use, a user simply places the lid 104 on the container 102 in the desired orientation -- the first orientation if the user wishes to seal the contents, or the second orientation if the user wishes the contents to be vented. To change the orientation of the lid, the user simply grasps the tab 140 of the lid 104 and pulls upward to remove the lid. The user then turns the lid to the desired orientation, by orienting the indicator 148 on the lid 104 with the desired one of the VENT/SEALED labels on the bowl 102, and presses the lid 104 downward into place. Thus, the container 100 can easily be adapted to store a wide variety of products, including fruits and vegetables that may require a vented container, and odor absorbing foods that may require a sealed container. Furthermore, the container 100 may be used in a microwave to heat food contained therein with the lid 104 firmly attached to the bowl 102. A user simply has to attach the lid 104 to the bowl 102 in the second orientation, such that the container 100 is vented. Then, the container 100 may be heated until the food

reaches a desired temperature, moisture and hot air being able to safely escape through the vent regions 112. Because the lid 104 is firmly attached to the bowl 102, there is less of a risk that the lid 104 will fall off during heating or removal of the container 100 from the microwave. Also, since the lid 104 is attached to the bowl 102, it is not likely to become deformed during heating. It is worth noting that certain fruits and vegetables may not respire as much as others. When such vegetables are stored in the container 100, it may de desirable to attach the lid 104 to the bowl 102 in the SEALED position.

[0057] Another feature of our invention is the ability to stack other containers or objects on top of the container 100. Because the container 100 is vented around its periphery -- and not through the top -- stacking other things onto top of the container 100 will not block the vents. Thus, even when two or more containers 100 are stacked, the contents of the containers can still be ventilated.

[0058] As mentioned above, the container 100 may also be used as a steamer to cook, for example, vegetables, crabs, etc. Specifically, water is poured in the bottom of the bowl 102 to a level below the tops of the raised ridges 130. The item to be cooked is then placed on top of the ridges 130 so that it is out of contact with the water. The lid 104 is then placed on the bowl 102 in the vented orientation and the container 100 is placed in a microwave oven and cooked for a desired period of time. As the food and water in the container 100 is heated, steam is generated within the container 100. The steam then quickly cooks the food in the container 100. Because the container 100 is vented, the steam is allowed to escape from the interior of the container 100 and no significant pressure builds up inside the container 100. If the container 100 is intended to be used as a steamer, it may be desirable to make the vent regions 112 of the lid 104 and/or the recessed portions 122 of the bowl 102 smaller, so that the steam escapes the container more slowly.

[0059] The container 100 of the first embodiment, as shown in FIG. 1, has a generally rectangular perimeter, when viewed from above. Of course, other shapes may also be used. For example, the perimeter of the container could be generally square (as shown in FIGS. 11-14), circular, rhomboid, trapezoidal, oval, or any other shape, geometric or otherwise, that is desirable for practical and/or aesthetic reasons. If, for example, the container 100 were to be constructed with a circular perimeter, the container could be constructed so that the amount

of venting of the container is infinitely adjustable. That is, the container could be made such that when the lid is attached to the bowl in a first orientation the container is sealed, but as the lid is rotated relative to the bowl the amount of venting is gradually and smoothly increased up to some maximum venting orientation. This infinitely adjustable container could be realized, for example, by making a recessed portion or notch in the upward flange of the bowl, the recessed portion extending slightly less than half way around the perimeter of the bowl. The lid could then be constructed having a vent region extending a distance around the perimeter of the lid corresponding in length to the length of the recessed portion of the bowl. When the lid is attached to the bowl, the amount of venting of the container could be gradually varied between a sealed condition (when the vent region of the lid and the recessed portion of the bowl do not overlap) and a completely vented condition (when the vent region of the lid and the recessed portion of the bowl completely overlap) or any intermediate venting condition therebetween.

[0060] A second embodiment of our invention is illustrated in FIGS. 11-13. The container of the second embodiment is similar to that of this first embodiment, except that it has a substantially square perimeter. As illustrated in FIG. 11, the container comprises a bowl 202 and a lid 204. The bowl has a rim 206 with an outward flange 218 and an upward flange 216. The upward flange 216 has a pair of notched or recessed portions 222 formed on opposite sides of the rim 206.

[0061] The lid 204 has an inverted V-shaped lip 208 about its perimeter, and a tab 240 for grasping the lid 204. The lip 208 includes a pair of vent regions 212 disposed on opposite edges of the lid 204. Each of the vent regions 212 comprises a plurality of substantially hemispherical domes 244. As best seen in FIG. 13, a sealing bead 210 is formed on the inner face of the lip 208 to seal against the upward flange 216 of the bowl 202. The sealing bead 210 is adjacent to the opening of the V-shaped lip 208 over part of the perimeter of the lid 204 (the sides of the lid having no vent regions in FIG. 13), but transitions to a position adjacent the apex 220 of the inverted V-shaped lip 208 along the length of the vent region 212 (the central portion of FIG. 13).

[0062] The container of the second embodiment functions substantially the same as that of the first embodiment, except that, due to its square shape, the lid is attachable to the

container in four different orientations. In two of these orientations the lid 204 will be attached to the bowl 202 in a sealed condition, while in the other two orientations the lid 204 will be attached to the bowl 202 in a vented condition. Because the lid 204 has vent regions 212 on opposite sides of the lid 204 and the bowl 202 has recessed portions 222 on opposite sides of the bowl 202, the container will always be either sealed on all four sides or vented on two of the four sides. That is, the container of the second embodiment has a first (sealed) orientation, a second (vented) orientation offset from the first orientation by approximately 90 degrees about the vertical axis, a third (sealed) orientation offset from the second orientation by approximately 90 degrees about the vertical axis, and a fourth (vented) orientation offset from the third orientation by approximately 90 degrees, about the vertical axis. These angle measurements are measured in the positive (we.e., clockwise) direction.

[0063] Alternatively, the bowl 202 of the second embodiment could be configured to have recessed portions in the upward flange 216 on three of the bowl's four sides, each of these recessed portions being of a different height and/or width. The lid 204 could then be configured to have a vent region on only one side thereof. With this alternative arrangement, the lid 204 could be attached to the bowl 202 in four different orientations, each orientation having a different degree of venting. For example, the first orientation might correspond to a sealed condition, the second orientation might correspond to a slightly ventilated condition, the third orientation might correspond to a moderately ventilated condition, and the fourth orientation might correspond to a greatly ventilated condition. In embodiments such as this, where the amount of ventilation is variable, the amount of ventilation of the container may be selected in accordance with the respiration rate of the product stored.

[0064] In yet another variation, a single recessed portion could be formed in the upright flange of the bowl 202 and three vent regions could be formed on three of the four different sides of the lid 204, each of the three vent regions being of a different size. Accordingly, the lid 204 could be attached to the bowl 202 in four different orientations, each orientation again having a different degree of venting.

[0065] A third embodiment of our invention is illustrated in FIG. 14. This embodiment is similar to the second embodiment in many respects. The container of the third embodiment comprises a bowl 302 and a lid 304. The bowl has a rim 306 including an upward flange 316

and an outward flange 318. In this embodiment, however, instead of the notched or recessed portion like the first and second embodiments, this embodiment has a plurality of flange holes 311 formed in a portion of the upward flange 316. While the flange holes 311 are shown as being positioned along about half the perimeter of the rim 306, the number, size, and position of the flange holes 311 may be varied depending on other design considerations.

[0066] The lid 304 of the third embodiment includes a lip 308 about its perimeter, and a tab 340 for manipulation by a user. The lip has a vent region 312 formed around about half of the perimeter of the lip 308. While not shown, the third embodiment may employ a sealing bead similar to those of the first two embodiments. Instead of the hemispherical domes used in the first two embodiments, however, the vent region 312 of the third embodiment comprises a plurality of through-holes 344 formed in the outer surface of the lip 308.

[0067] When the lid 304 is attached to the bowl 302 in a first orientation, with the flange holes 311 positioned opposite from (we.e., not aligned with) the through-holes 344 of the vent region 312, the container is sealed. When the lid 304 is attached to the bowl 302 in a second orientation, with the flange holes 311 aligned with the through-holes 344 of the vent region 312, the container is vented.

[0068] In a variation of the third embodiment, flange holes could be formed in the upward flange 316 on three sides of the bowl 302, each side of the bowl 302 having a different number of flange holes. The lid 304 could be configured with through-holes on only one side thereof, the number of through-holes equal to the number of flange holes on the side of the bowl 302 with the greatest number of flange holes. In this arrangement, the lid 304 would be attachable to the container 302 in four different orientations, each orientation providing a different degree of venting. Alternatively, the placement of the holes in the bowl 302 and the lid 304 could be reversed, such that the lid 304 has holes on three sides thereof and the bowl has holes on only one side. Either of these arrangements would be equally effective.

[0069] While the present invention has been described with respect to several preferred embodiments, these embodiments are provided for illustrative purposes only and are not

intended to limit the scope of the invention. In particular, WE envision that the various features of the several embodiments of our invention may be combined and modified to suit the needs of a particular application. For example, the bowl and the lid might be used independently of one another, or in combination with other lids and/or bowls. In addition, the size, shape, color, and/or material of the container may be modified to accommodate a certain type of product or class of user. For example, the shape of the container may be chosen to accommodate a certain type/shape of product, such as using a long rectangular container for carrots, celery, or the like, and using a round container for a head of lettuce. Alternatively, the shape might be dictated by the amount of ventilation needed or the need for the ventilation of the container to be adjusted.

[0070] In addition, while several specific venting features are disclosed, numerous other shapes and configurations of vent regions could instead be used. For example, instead of the plural hemispherical domes disclosed in the first embodiment, a single elongated flared portion could be used, one or more oblong domes could be used, a portion of the lid or bowl could simply be cut away or notched to form the vent region, or any other suitable feature that could provide venting of the lid portion could be employed. Furthermore, while the lid is disclosed as having a lip that fits over a rim of the bowl, these features could easily be reversed, such that the rim is disposed on the lid and the lip is disposed on the bowl.

[0071] One of ordinary skill in the art will realize that these and other various modifications and variations are possible within the spirit and scope of our invention, which is intended to be limited in scope only by the accompanying claims, which should be accorded the broadest interpretation so as to encompass all such modifications, equivalent structures and functions.

INDUSTRIAL APPLICABILITY

Our invention is generally applicable to containers with lids. In particular, our invention is applicable to containers intended for storing food, and, in some circumstances, cooking the same.